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L8: Entry 1 of 2 File: USPT Sep 22, 1992

US-PAT-NO: 5149025
DOCUMENT-IDENTIFIER: US 5149025 A

TITLE: Detection of overheated railroad wheel and axle components

DATE-ISSUED: September 22, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Utterback; Jeffery J.	Harrisonville	MO		
Mecca; Randall S.	Warrensburg	MO		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Harmon Industries, Inc.	Blue Springs	MO			02

APPL-NO: 07/ 759237 [PALM]
DATE FILED: September 13, 1991

PARENT-CASE:
CROSS REFERENCE TO RELATED APPLICATION this application is a division of application Ser. No. 415,103, filed on Sept. 29, 1989, now U.S. Pat. No. 5,060,890, which a continuation-in-part of application Ser. No. 255,787, filed on Oct. 11, 1988, now U.S. Pat. No. 4,928,910.

INT-CL: [05] B61K 9/06

US-CL-ISSUED: 246/169A; 250/342, 250/252.1, 340/682
US-CL-CURRENT: 246/169A; 250/252.1, 250/342, 340/682

FIELD-OF-SEARCH: 246/169A, 246/169D, 250/338.3, 250/252.1, 250/340, 250/341, 250/342, 250/239, 340/600, 340/682

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL Clear

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
3065347	November 1962	Bossart	246/169D
3545005	December 1970	Gallagher	246/169D
4068811	January 1978	Caulier	250/338.3

☐	4313583	February 1982	Bambara et al.	340/682
☐	4659043	April 1987	Gallagher	246/169A

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
969348	September 1964	GB	246/169A
2075183	November 1981	GB	246/169A

ART-UNIT: 313

PRIMARY-EXAMINER: Oberleitner; Robert J.

ASSISTANT-EXAMINER: Le; Mark T.

ATTY-AGENT-FIRM: Chase; D. A. N.

ABSTRACT:

Overheated railroad journal bearings, wheels, and other wheel components on a moving or stationary railroad train are detected by amplifying the current signal from an infrared radiation sensor comprising a pytoelectric cell. A reference temperature is sensed by chopping the incident infrared radiation with an asynchronous shutter that momentarilly closes at successive time spacings of shorter duration than the scanning period of the sensor. The amplified signal is converted to a digital signal and processed by a microcontroller and associated hardware and software. The detector automatically and periodically calibrates itself and compensates the temperature signals for any temperature difference between the ambient external temperature and the temperature inside the detector housing. The output signal may be digital or analog.

8 Claims, 27 Drawing figures

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L8: Entry 2 of 2 File: USPT Oct 29, 1991

US-PAT-NO: 5060890
DOCUMENT-IDENTIFIER: US 5060890 A
**** See image for Certificate of Correction ****

TITLE: Detection of overheated railroad wheel and axle components

DATE-ISSUED: October 29, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Utterback; Jeffrey J.	Harrisonville	MO		
Mecca; Randall S.	Warrensburg	MO		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Harmon Industries, Inc.	Blue Springs	MO			02

APPL-NO: 07/ 415103 [PALM]
DATE FILED: September 29, 1989

PARENT-CASE:
CROSS REFERENCE TO RELATED APPLICATION This application is a continuation in part of application Ser. No. 255,787, filed Oct. 11, 1988, now U.S. Pat. No. 4,928;

INT-CL: [05] B61K 9/06

US-CL-ISSUED: 246/169A; 250/342, 340/682, 340/600, 340/584
US-CL-CURRENT: 246/169A; 250/342, 340/584, 340/600, 340/682

FIELD-OF-SEARCH: 246/169D, 246/169A, 250/338.3, 250/340, 250/342, 250/341, 250/338.1, 340/682, 340/600, 340/584

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	3303340	February 1967	Hewett et al.	246/169D
☐	3545005	December 1970	Gallagher	246/169A
☐	3733499	May 1973	Deis et al.	250/338.3

☐	4068811	January 1978	Caulier	246/169A
☐	4765413	August 1988	Spector et al.	250/342
☐	4813003	March 1989	Cox et al.	250/338.3
☐	4928910	May 1990	Utterback et al.	246/169A

ART-UNIT: 313

PRIMARY-EXAMINER: Graham; Matthew C.

ASSISTANT-EXAMINER: Le; Mark T.

ATTY-AGENT-FIRM: Chase; D. A. N.

ABSTRACT:

Overheated railroad journal bearings, wheels, and other wheel components on a moving or stationary railroad train are detected by amplifying the current signal from an infrared radiation sensor comprising a pyroelectric cell. A reference temperature is sensed by chopping the incident infrared radiation with an asynchronous shutter that momentarily closes at successive time spacings of shorter duration than the scanning period of the sensor. The amplified signal is converted to a digital signal and processed by a microcontroller and associated hardware and software. The detector automatically and periodically calibrates itself and compensates the temperature signals for any temperature difference between the ambient external temperature and the temperature inside the detector housing. The output signal may be digital or analog.

8 Claims, 27 Drawing figures

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10/721227

Refine Search

Search Results -

Terms	Documents
L12 and (correct$ with (factor or coefficient)) and (wheel$ with sens$) and (train or locomotive)	3

Database:

US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Search: L13

Refine Search

Recall Text Clear Interrupt

Search History

DATE: Monday, May 30, 2005 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT; THES=ASSIGNEE; PLUR=YES; OP=OR		
L13	L12 and (correct$ with (factor or coefficient)) and (wheel$ with sens$) and (train or locomotive)	3	L13
L12	(110 or 111)	153	L12
L11	(D333251 | 308830 | 4527661 | 2089369 | 5127742 | 5331311 | 4316175 | 5689890 | D385173 | 5313335 | 5244287 | 5280555 | 5572033 | 5066197 | 3235723 | 5392716 | 5959298 | 5173881 | 6271761 | D280427 | 3790777 | 6373394 | D387996 | 4820057 | 4058279 | 6470273 | 6203115 | 5455707 | 4119284 | 6006868 | 5524974 | 3033018 | 4263585 | 5381009 | D379579 | 3546447 | 4523095 | 4702104 | D386664 | 3824579 | 6405132 | 5668539 | 5446452 | 4313583 | 5335995 | 5060760 | 5478151 | 5936155 | 4491290 | 2771039 | 5249157 | 4356790 | 5201483 | 4323211 | 4340890 | D344006 | 5381700 | 4558342 | 5660470 | 4501006 | 6222454 | 2001/0030466 | 4926170 | 4674412 | 5812053 | 4928910 | 5909171 | 4805854 | 5203278 | 6011827 | 5677533 | 4443119 | 4113211 | 4260980 | 5651431 | 5419415 | 4766421 | 5833371 | 5789735 | 5742240 |	144	L11

	5060890 | 961098 | 5166681 | 5372221 | 5397900 | 4550589 | 2002/0051593 | 3454758 | 4347569 | 5339075 | 3646343 | 4694295 | 5446451 | 6310545 | 4812826 | 4781060 | 4696446 | 4974797 | 3052123 | 4964679 | 6250430 | 5779005 | 2002/0062694 | 5565683 | 4914673 | 4450430 | 5145322 | 3998549 | 6260665 | 3731087 | 2721934 | 3926053 | 4695823 | 2961875 | 5483827 | 2002/0105429 | 5742920 | 3994458 | 4068811 | 4960251 | 5249128 | 5122796 | 4074575 | 5381692 | 5509359 | 3767146 | 5149025 | 4906976 | 4818119 | 4854162 | 3629572 | 4447800 | 4659043 | 4722612 | 4878761 | 6286992 | 5081998 | 5448072 | 4674326 | 985650 | 5442178 | 4790606 | 5433525 | 5463384 | D347375 | 4136954 | 5083025 | 5107120 | 5100243 | 5189391 | 6095289)![PN]		
L10	('6813581'| '6095289'| 'D402178'| '6881951'| '6823242'| '6753766'| '6237877'| '6312226'| '6615954'| '6872945'| '5149025'| '5060890')[PN]	12	L10
L9	('5149025'| '5060890')[URPN]	20	L9
L8	L7 and (wheel$ with sens$)	2	L8
L7	L6 and (train Or locomotive)	2	L7
L6	L5 and (correct$ with (factor or coefficient))	2	L6
L5	L4 or l3 or l2 or l1	4	L5
L4	5060890.pn.	1	L4
L3	5149025.pn.	1	L3
L2	6701228.pn.	1	L2
L1	5247338.pn.	1	L1

END OF SEARCH HISTORY

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L13: Entry 1 of 3 File: USPT Jun 11, 2002

US-PAT-NO: 6405132
DOCUMENT-IDENTIFIER: US 6405132 B1
**** See image for Certificate of Correction ****

TITLE: Accident avoidance system

DATE-ISSUED: June 11, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Breed; David S.	Boonton Township, Morris County	NJ		
Johnson; Wendell C.	Signal Hill	CA		
Duvall; Wilbur E.	Kimberling City	MO		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Intelligent Technologies International, Inc.	Denville	NJ			02

APPL-NO: 09/ 679317 [PALM]
DATE FILED: October 4, 2000

PARENT-CASE:
CROSS REFERENCE TO RELATED APPLICATIONS This application is a continuation-in-part of U.S. patent application Ser. No. 09/523,559 filed Mar. 10, 2000 which in turn is a continuation-in-part of U.S. patent application Ser. No. 09/177,041 filed Oct. 22, 1998 which claims priority under 35 U.S.C. .sctn.119(e) of U.S. provisional patent application Ser. No. 60/062,729 filed Oct. 22, 1997. This application also claims priority under 35 U.S.C. .sctn.119(e) of U.S. provisional patent application Ser. No. 60/123,882 filed Mar. 11, 1999 through the '559 application. This patent is also a continuation in part of U.S. patent application Ser. No. 09/024,085 filed Feb. 27, 1998, now U.S. Pat. No. 6,209,909 which is a continuation in part of U.S. patent application Ser. No. 08/247,760 filed May 23, 1994, now abandoned.

INT-CL: [07] G01 C 23/00, G06 F 17/00

US-CL-ISSUED: 701/301; 701/213, 701/45, 701/117
US-CL-CURRENT: 701/301; 701/117, 701/213, 701/45

FIELD-OF-SEARCH: 701/301, 701/213, 701/45, 701/23, 701/117, 701/216, 342/357.06, 342/357.09, 342/357.08, 340/436

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4298280	November 1981	Harney	356/5
☐	4352105	September 1982	Harney	343/5CD
☐	4521861	June 1985	Logan et al.	364/517
☐	5128669	July 1992	Dadds et al.	340/901
☐	5177685	January 1993	Davis et al.	364/443
☐	5181037	January 1993	Komatsu	342/70
☐	5235316	August 1993	Qualizza	340/436
☐	5249128	September 1993	Markandey et al.	364/426.04
☐	5272483	December 1993	Kato	342/357
☐	5314037	May 1994	Shaw et al.	180/169
☐	5361070	November 1994	McEwan	342/21
☐	5367463	November 1994	Tsuji	364/449
☐	5381338	January 1995	Wysocki et al.	701/207
☐	5383127	January 1995	Shibata	364/449
☐	5416712	May 1995	Geier et al.	364/450
☐	5438517	August 1995	Sennott et al.	364/449
☐	5450329	September 1995	Tanner	701/213
☐	5463384	October 1995	Juds	340/903
☐	5467072	November 1995	Michael	340/436
☐	5477458	December 1995	Loomis	364/449
☐	5479173	December 1995	Yoshioka et al.	342/70
☐	5486832	January 1996	Hulderman	342/70
☐	5504482	April 1996	Schreder	340/995
☐	5506584	April 1996	Boles	342/42
☐	5510800	April 1996	McEwan	342/387
☐	5519400	May 1996	McEwan	342/28
☐	5523765	June 1996	Ichikawa	342/451
☐	5528391	June 1996	Elrod	359/36
☐	5529138	June 1996	Shaw et al.	180/169
☐	5530447	June 1996	Henderson et al.	342/70
☐	5530651	June 1996	Uemura et al.	364/461
☐	5540298	July 1996	Yoshioka et al.	180/169
☐	5570087	October 1996	Lemelson	340/870.05
☐	5572428	November 1996	Ishida et al.	364/461
☐	5572482	November 1996	Hoshizaki et al.	365/233
☐	5576715	November 1996	Litton et al.	342/357

☐	5576972	November 1996	Harrison	364/516
☐	5583513	December 1996	Cohen	342/357
☐	5585798	December 1996	Yoshioka et al.	342/70
☐	5587715	December 1996	Lewis	342/357
☐	5589838	December 1996	McEwan	342/387
☐	5606506	February 1997	Kyrtsos	364/449.1
☐	5613039	March 1997	Wang et al.	395/22
☐	5619212	April 1997	Counselman III	342/357
☐	5621646	April 1997	Enge et al.	364/449
☐	5699056	December 1997	Yoshida	340/905
☐	5757646	May 1998	Talbot et al.	364/449.9
☐	5767953	June 1998	McEwan	356/5.01
☐	5774091	June 1998	McEwan	342/387
☐	5809437	September 1998	Breed	701/29
☐	5841367	November 1998	Giovanni	340/903
☐	5901171	May 1999	Kohli et al.	375/200
☐	5907293	May 1999	Tognazzini	340/903
☐	5926117	July 1999	Gunji et al.	340/988
☐	5926126	July 1999	Engelman	342/70
☐	5952941	September 1999	Mardirossian	340/936
☐	5983161	November 1999	Lemelson et al.	701/301
☐	6014608	January 2000	Seo	701/207

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FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
4434789	April 1996	DE	
6-337286	December 1994	JP	
7-200861	August 1995	JP	

OTHER PUBLICATIONS

SRI International, Centimeter-Level GPS for Highway Systems, J.W. Sinko et al., Jul., 1998.
SRI International, An Evolutionary Automated Highway System Concept Based on GPS, J.W. Sinko, Sep., 1996 (p. 5, second col. to p. 7.
SRI International, Using GPS for Automated Vehicle Convoying, T.M. Nguyen, Sep. 1998.
Centerline Survey, B. Holmgren, National Land Survey of Sweden No date.
Autovue: Active Lane Departure Warning System, Odetics. Copyright 1997.
V. Morellas et al., Preview Based Control of a Tractor Trailer Using DGPS for Preventing Road Depature Accidents, 1998 IEEE International Conference on Intelligent Vehicles, pp. 797-805.
S. Bajikar et al., Evaluation of In-Vehicle GPS-Based Lane Position Sensing for

Preventing Road Departure, 1998 IEEE International Conference on Intelligent Vehicle, pp. 397-402.
B. Schiller et al., Collision Avoidance for Highway Vehicles Using the Virtual Bumper Controller, 1998 IEEE International Conference on Intelligent Vehicles, pp. 149-155.

ART-UNIT: 3661

PRIMARY-EXAMINER: Zanelli; Michael J.

ATTY-AGENT-FIRM: Roffe; Brian

ABSTRACT:

System and method for preventing vehicle accidents in which GPS ranging signals relating to a host vehicle's position on a roadway on a surface of the earth are received on a first communication link from a network of satellites and DGPS auxiliary range correction signals for correcting propagation delay errors in the GPS ranging signals are received on a second communication link from a station or satellite. The host vehicle's position on a roadway on a surface of the earth is determined from the GPS, DGPS, and accurate map database signals with centimeter accuracy and communicated to other vehicles. The host vehicle receives position information from other vehicles and determines whether any other vehicle from which position information is received represents a collision threat to the host vehicle based on the position of the other vehicle relative to the roadway and the host vehicle. If so, a warning or vehicle control signal response to control the host vehicle's motion is generated to prevent a collision with the other vehicle.

53 Claims, 17 Drawing figures

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L13: Entry 1 of 3 File: USPT Jun 11, 2002

DOCUMENT-IDENTIFIER: US 6405132 B1
**** See image for Certificate of Correction ****
TITLE: Accident avoidance system

Brief Summary Text (3):
This invention is in the fields of automobile safety, intelligent highway safety systems, accident avoidance, accident elimination, collision avoidance, blind spot detection, anticipatory sensing, automatic vehicle control, intelligent cruise control, vehicle navigation and other automobile, truck and train safety, navigation and control related fields.

Brief Summary Text (21):
The information listed above is still insufficient. The geometry of a road or highway can be determined once and for all, until erosion or construction alters the road. Properly equipped vehicles can know their location and transmit that information to other properly equipped vehicles. There remains a variety of objects whose location is not fixed, which have no transmitters and which can cause accidents. These objects include broken down vehicles, animals such as deer which wander onto highways, pedestrians, bicycles, objects which fall off of trucks, and especially other vehicles which are not equipped with location determining systems and transmitters for transmitting that information to other vehicles. Part of this problem can be solved for congested highways by restricting access to these highways to vehicles that are properly equipped. Also, these highways are typically in urban areas and access by animals can be effectively eliminated. Heavy fines can be imposed on vehicles that drop objects onto the highway. Finally, since every vehicle and vehicle operator becomes part of the process, each such vehicle and operator becomes a potential source of information to help prevent catastrophic results. Thus, each vehicle should also be equipped with a system of essentially stopping the process in an emergency. Such a system could be triggered by vehicle sensors detecting a problem or by the operator strongly applying the brakes, rapidly turning the steering wheel or by activating a manual switch when the operator observes a critical situation but is not himself in immediate danger. An example of the latter case is where a driver witnesses a box falling off of a truck in an adjacent lane.

Brief Summary Text (49):
"Recently, certain experimental integrated vehicular dynamic guidance systems have been proposed. Motorola has disclosed an Intelligent Vehicle Highway System in block diagram form in copyright dated 1993 brochure. Delco Electronics has disclosed another Intelligent Vehicle Highway System also in block diagram form in Automotive News published on Apr. 12 1993. These systems use compass technology for vehicular positioning. However, displacement wheel sensors are plagued by tire slippage, tire wear and are relatively inaccurate requiring recalibration of the current position. Compasses are inexpensive, but suffer from drifting particularly when driving on a straight road for extended periods. Compasses can sense turns, and the system may then be automatically recalibrated to the current position based upon sensing a turn and correlating that turn to the nearest turn on a digitized map, but such recalibration, is still prone to errors during excessive drifts. Moreover, digitized map systems with the compass and wheel sensor positioning methods operate in two dimensions on a three dimensional road terrain injecting

further errors between the digitized map position and the current vehicular position due to a failure to sense the distance traveled in the vertical dimension."

Brief Summary Text (51):
"These Intelligent Vehicle Highway Systems use the compass and wheel sensors for vehicular positioning for route guidance, but do not use accurate GPS and inertial route navigation and guidance and do not use inertial measuring units for dynamic vehicular control. Even though dynamic electronic vehicular control, for example, anti-lock braking, anti-skid steering, and electronic control suspension have been contemplated by others, these systems do not appear to functionally integrate these dynamic controls with an accurate inertial route guidance system having an inertial measuring unit well suited for dynamic motion sensing. There exists a need to further integrate and improve these guidance systems with dynamic vehicular control and with improved navigation in a more comprehensive system."

Detailed Description Text (38):
The system described here will achieve a higher accuracy than reported in the above table due to the combination of the inertial guidance system that permits accurate changes in position to be determined and through multiple GPS readings. In other words, the calculated position will converge to the real position over time. The addition of DGPS will provide an accuracy improvement of at least a factor of 10, which, with the addition of a sufficient number of DGPS stations in some cases is sufficient without the use of the carrier frequency correction. A further refinement where the vehicle becomes its own DGPS station through the placement of infrastructure stations at appropriate locations on roadways will further significantly enhance the system accuracy to the required level.

Detailed Description Text (257):
As a check on the inertial system, a velocity sensor 76 based on a wheel speed sensor, for example, can be provided for the system. Other systems are preferably used for this purpose such as the GPS/DGPS or precise position systems.

Detailed Description Text (296):
At the time the neural network circuit 63 has learned from a suitable number of patterns of the training data, the result of the training is tested by the test data. In the case where the rate of correct answers of the object identification unit based on this test data is unsatisfactory, the neural network circuit 63 is further trained and the test is repeated. Typically about 200,000 feature patterns are used to train the neural network 63 and determine all of the weights. A similar number is then used for the validation of the developed network. In this simple example chosen, only three outputs are illustrated. These can represent another vehicle, a truck and a pole or tree. This might be suitable for an early blind spot detector design. The number of outputs depends on the number of classes of objects that are desired. However, too many outputs can result in an overly complex neural network and then other techniques such as modular neural networks can be used to simplify the process. When a human looks at a tree, for example, he or she might think "what kind of tree is that?" but not "what kind of tiger is that". The human mind operates with modular neural networks where the object to be identified is first determined to belong to a general class and then to a subclass etc. Object recognition neural networks can frequently make use of this principle with a significant simplification resulting.

Detailed Description Text (310):
Although the system has been illustrated for use with automobiles, naturally the same system would apply for all vehicles including trucks, trains an even airplanes taxing on runways. It also would be useful for use with cellular phones and other devices carried by humans. The combination of the PPS system and cellular phones permits the precise location of a cellular phone to be determined within centimeters by an emergency operator receiving a 911 call, for example. Such RFID

tags can be inexpensively placed both inside and outside of buildings, for example.

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